REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*
28 Nov 2000

2. REPORT TYPE
Abstract

3. DATES COVERED *(From - To)*
28 Nov 2000

4. TITLE AND SUBTITLE
In-Situ acoustic and laboratory ultrasonic sound speed and Attenuation measured in heterogeneous seabed sediments: Eel Margin, CA

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER
062435N

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

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8. PERFORMING ORGANIZATION REPORT NUMBER
AB/7430-00-2007

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Office of Navy Research
800 N. Quincy St.
Arlington, VA 22217-5000

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION / AVAILABILITY STATEMENT
Approved for Public Release; Distribution Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

AB: We calculated in-situ and laboratory measurements of sound speed and attenuation in seafloor sediments from the shallow water delta of the Eel River, California. This region receives a substantial volume of fluvial sediment that is discharged annually onto the shelf. Additionally, high input of fluvial sediments during storms generates flood deposits characterized by thin-beds of variable grain-sizes in water depths between 40 and 90 m. Main objectives of this study were (1) to investigate signatures of seafloor processes on geoacoustic and physical properties, and (2) to evaluate differences between geoacoustic parameters measured in-situ at acoustic (7.5 kHz) and in the laboratory at ultrasonic (400 kHz) frequencies. The in-situ acoustic measurements were conducted between the 60 and 100 isobath. Wet-bulk density and porosity profiles were obtained to 1.15 meters below seafloor (mbsf) using gravity cores of the mostly cohesive fine-grained sediments across- and along-shelf. Our physical and geoacoustic property measurements from six selected sites on the Eel margin showed: (1) Sound speed and wet-bulk density strongly correlated.

15. SUBJECT TERMS
In-situ, attenuation, heterogeneous seabed sediments, Eel Margin, CA, sound speed

16. SECURITY CLASSIFICATION OF: Abstract Unclassified			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Michael Richardson
Unclassified	Unclassified	Unclassified	SAR	1	19b. TELEPHONE NUMBER *(include area code)* 228-688-4621

SC: T
MN: Fall Meeting 2000

HR: 0830h
AN: T61A-10
TI: **In-situ Acoustic and Laboratory Ultrasonic Sound Speed and Attenuation Measured in Heterogeneous Seabed Sediments: Eel Margin, California**

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AB: We calculated in-situ and laboratory measurements of sound speed and attenuation in seafloor sediments from the shallow water delta of the Eel River, California. This region receives a substantial volume of fluvial sediment that is discharged annually onto the shelf. Additionally, high input of fluvial sediments during storms generates flood deposits characterized by thin-beds of variable grain-sizes in water depths between 40 and 90 m. Main objectives of this study were (1) to investigate signatures of seafloor processes on geoacoustic and physical properties, and (2) to evaluate differences between geoacoustic parameters measured in-situ at acoustic (7.5 kHz) and in the laboratory at ultrasonic (400 kHz) frequencies. The in-situ acoustic measurements were conducted between the 60 and 100 isobath. Wet-bulk density and porosity profiules were obtained to 1.15 meters below seafloor (mbsf) using gravity cores of the mostly cohesive fine-grained sediments across- and along-shelf. Our physical and geoacoustic property measurements from six selected sites on the Eel margin showed: (1) Sound speed and wet-bulk density strongly correlated. (2) In most cases, sediment compaction with depth led to increased sound speed and density and decreased porosity and in-situ attenuation values. (3) Scattering effects due to inhomogeneities caused higher ultrasonic attenuation when

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measured in coarse-grained sediments. (4) Sound speed was higher in coarser-than finer-grained sediments on an average by 80 ${msec}^{-1}$. (5) In coarse-grained sediments higher sound speed was measured in the laboratory (1560 ${msec}^{-1}$) than in-situ (1520 ${msec}^{-1}$). In contrast, average ultrasonic and in-situ sound speed in fine-grained sediments showed only little differences (both approx. 1480 ${msec}^{-1}$). (6) Higher attenuation was commonly measured in the laboratory (0.4 and 0.8 ${dBm}^{-1}{kHz}^{-1}$) than in-situ (0.02 and 0.65 ${dBm}^{-1}{kHz}^{-1}$), and remained almost constant below 0.4 mbsf. We attributed discrepancies between laboratory ultrasonic and in-situ acoustic measurements to frequency dependence of velocity and attenuation. In addition, laboratory attenuation was most likely enhanced due to scattering of sound waves at heterogeneities that were on the scale of ultrasonic wavelengths, while high in-situ attenuation values were linked to stratigraphic scattering at thin-bed layers that form along with flood deposits.

DE: 4219 Continental shelf processes
SC: T
MN: Fall Meeting 2000

HR: 0830h
AN: T61A-01
TI: **Intricate BSR and Bright Spot distribution of the Yaquina Forearc Basin, Peru**

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AB: In order to study the interaction between BSR occurrence, gas abundance, tectonic uplift, and sedimentation in the Yaquina Basin we carried out a high-resolution reflection seismic survey in the frame of the GEOPECO project (SONNE Leg 146). The Yaquina Basin is located between 8 deg. S and 10 deg. S on the midslope of the Andean Continental Margin. This part of the Peruvian Margin has undergone tectonic uplift and, subsequently subsidence by the oblique subduction of the Nazca Ridge. The seismic lines were tied to the ODP sites of Leg 112, which allows correlation between seismic data and core stratigraphy. We used GI-Gun sources to avoid misinterpretations due to bubble generation. The most striking observations have been made at the widest part of the basin at 8 deg. 30 min. S in water depth of about 900 m. Perpendicular to the slope a bright spot changes abruptly into a weak BSR. Several disrupted bright spots are resolved some 10 ms beneath the BSR, indicating strong vertical

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